

## PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

SON, Min

19th Floor, City Air Tower 159-9, Samseong-dong, Gangnam-  
gu, Seoul 135-973 Republic of Korea

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing

(day/month/year) 11 JULY 2005 (11.07.2005)

Applicant's or agent's file reference

PCTA9502-92

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/KR2005/000532

International filing date (day/month/year)

25 FEBRUARY 2005 (25.02.2005)

Priority date (day/month/year)

26 FEBRUARY 2004 (26.02.2004)

International Patent Classification (IPC) or both national classification and IPC

IPC7 C12N 15/54

Applicant

CJ Corporation et al

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR



Korean Intellectual Property Office  
920 Dunsan-dong, Seo-gu, Daejeon 302-701,  
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JEONG Eui Jun

Telephone No.



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/000532

**Box No. I Basis of this opinion**

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☒ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☒ in written format  
☒ in computer readable form

c. time of filing/furnishing

- ☒ contained in the international application as filed.  
☒ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/KR2005/000532

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	1 - 7	YES
	Claims	None	NO
Inventive step (IS)	Claims	1 - 6	YES
	Claims	7	NO
Industrial applicability (IA)	Claims	1 - 7	YES
	Claims	None	NO

**2. Citations and explanations :**

The following document has been considered for the purpose of this written opinion:

D1 : Biochemical and Biophysical Research Communications, Vol. 250, pp 506-510 (1998).

Frederic M.V. et al. 'Carnitine Biosynthesis: Identification of the cDNA Encoding Human gamma-Butyrobetaine Hydroxylase.'

The present invention relates to gamma-butyrobetaine hydroxylase (gamma-BBH) originating from *Neurospora crassa*. More particularly, the present invention relates to a polynucleotide encoding gamma-butyrobetaine hydroxylase originating from *Neurospora crassa*, a recombinant vector comprising the polynucleotide, a transformant transformed with the recombinant vector, gamma-butyrobetaine hydroxylase encoded by the polynucleotide, and a method of preparing L-carnitine by hydroxylating gamma-butyrobetaine using gamma-butyrobetaine hydroxylase encoded by the polynucleotide.

**1. Novelty and Inventive Step**

Claims 1-6 relate to a polynucleotide encoding gamma-butyrobetaine hydroxylase originating from *Neurospora crassa*, a recombinant vector comprising the polynucleotide, a transformant transformed with the recombinant vector, gamma-butyrobetaine hydroxylase encoded by the polynucleotide. But D1 does not teach or suggest the polynucleotide gamma-butyrobetaine hydroxylase originating from *Neurospora crassa* defined in claims 1 to 6. Therefore, claims 1 and 6 are considered to be novel [PCT Article 33(2)] and inventive [PCT Article 33(3)].

Claim 7 relates to a method of preparing L-carnitine by hydroxylating gamma-butyrobetaine using gamma-butyrobetaine hydroxylase encoded by the polynucleotide. D1 discloses gamma-butyrobetaine hydroxylase catalyzes the formation of L-carnitine from gamma-butyrobetaine. And this enzyme is expressed in many organisms, ranging from bacteria to mammals.

The different feature between claim 7 and D1 is only the origin of gamma-butyrobetaine hydroxylase. But it is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

Therefore, claim 7 is considered to be novel [PCT Article 33(2)] but do not meet the requirements of inventive step [PCT Article 33(3)].

**2. Industrial Applicability**

The subject matter of claims 1-7 is considered to be industrially applicable [PCT Article 33(4)].